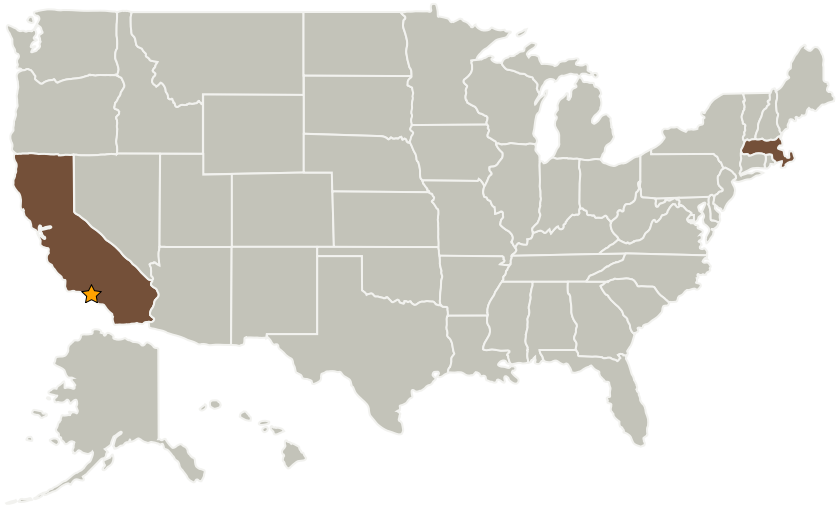
Single Crystal Bimorph Array Driven Deformable Mirrors, Phase I

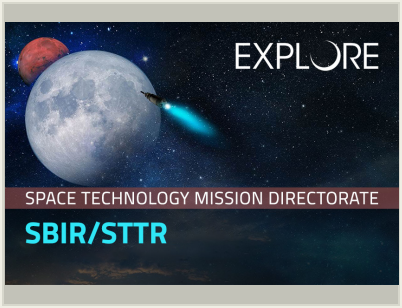
Completed Technology Project (2008 - 2008)

Project Introduction

This Small Business Innovation Research (SBIR) Phase I project will research a novel deformable mirror design for NASA adaptive optics telescope applications . The innovation offers reliable mechanics for the strained architecture, facilitating dynamic modeling and the control of the overall mirror system. A system-level finite element analysis and design optimization, in combination with proof-of-concept experimental verification methods, will be adopted to identify the most promising design for the future adaptive optics telescope systems. Focus will be given to improve the long time reliability and stability of the system while reducing thermal distortions for the mirror system. In Phase I, the proposed deformable mirror system will be designed and extensively modeled using finite element analysis technique to examine its electro-mechanical response, thermal-mechanical responses, and the various radiation-induced thermal-mechanical responses, respectively. Based on the design, Phase I will see the prototyping and testing of a 5x5 array sub-scale model.

Primary U.S. Work Locations and Key Partners





Single Crystal Bimorph Array Driven Deformable Mirrors, Phase I

Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Single Crystal Bimorph Array Driven Deformable Mirrors, Phase I

Completed Technology Project (2008 - 2008)

Organizations Performing Work	Role	Type	Location
★Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
Microscale, Inc.	Supporting Organization	Industry Small Disadvantaged Business (SDB)	Woburn, Massachusetts

Primary U.S. Work Locations	
California	Massachusetts

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Xingtao Wu

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.2 Observatories
    - TX08.2.1 Mirror Systems